

JAPANESE

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CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE INVENTION TECHNICAL PROBLEM MEANS EXAMPLE DESCRIPTION OF DRAWINGS DRAWINGS

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

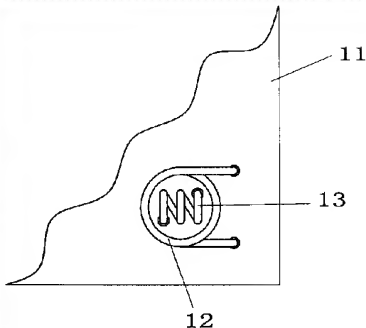
[0001]

[Field of the Invention]This invention relates to the composite electronic component which mounted the air cored coil and the capacitor in the substrate and in which the double tuned circuit was formed.

[0002]

[Description of the Prior Art]Drawing 8 is a circuit diagram of a double tuned circuit, and is provided with the primary side tuned circuit 84 where the capacitor was connected with the coil L1 in parallel, and the secondary tuned circuit 85 where the capacitor was connected with the coil L2 in parallel. The coil L1 of the primary side tuned circuit 84 and the coil L2 of the secondary tuned circuit 85 are combined magnetically. Drawing 9 is a side view of the conventional composite electronic component which unified the double tuned circuit of drawing 8. The air cored coil 92 around which the coil L1 wound winding spirally is used. The air cored coil 93 around which the coil L2 wound winding spirally is used. The air cored coil 92 and the air cored coil

Drawing selection **Representative draw**



[Translation done.]

93 are mounted in the substrate 91 which has two or more terminals, and are connected to a capacitor by the circuit pattern of the substrate 91, respectively. The coupling coefficient of the air cored coil 92 and the air cored coil 93 is adjusted with the mutual distance l on the substrate 91. The graphic display of the capacitor was omitted.

[0003]

[Problem(s) to be Solved by the Invention] Since the conventional composite electronic component formed in this appearance is adjusted with the mutual distance [coupling coefficient / of the air cored coil 92 and the air cored coil 93] l on a substrate, when a coupling coefficient is made small according to the characteristic of a double tuned circuit, the distance l between air cored coils becomes long. Therefore, the conventional composite electronic component had the problem that a substrate became large and the shape of a composite electronic component became large. The conventional composite electronic component needed to prepare the substrate for every coupling coefficient between air cored coils, and there was a problem that management of a substrate became complicated.

[0004] An object of this invention is to provide the composite electronic component which can miniaturize shape even if it forms a double tuned circuit using an air cored coil.

[0005]

[Means for Solving the Problem] This invention connects the 1st air cored coil and 1st capacitor, and a tuned circuit is formed, Connect the 2nd air cored coil and 2nd capacitor, and a tuned circuit is formed, and the 1st air cored coil and 2nd air cored coil in a composite electronic component combined magnetically the 1st air cored coil, It is attached to a substrate so that the roller may become vertical to the surface of a substrate, and the 2nd air cored coil is attached to a substrate so that it may be located in a centrum of the 1st air cored coil. In a centrum of the 1st air cored coil, this 2nd air cored coil is attached at a substrate so that that roller may become level on the surface of a substrate, or it is attached to a substrate so that that roller may become vertical to the surface of a substrate.

[0006]

[Example] Hereafter, it explains with reference to drawing 1 thru/or drawing 7 in which the example of the composite electronic component of this invention is shown. The side view of drawing 1 and drawing 3 of the plan and drawing 2 which drawing 1 shows the 1st example of the composite electronic component of this invention are the fragmentary sectional views of drawing 2. In drawing 1 thru/or drawing 3, the substrate with which 11 has two or more terminals,

and 12 and 13 are air cored coils. The air cored coil 12 winds winding spirally, is formed, and it is attached to the substrate 11 so that the roller may become vertical to the surface of the substrate 11. The lead of the air cored coil 12 is inserted in the breakthrough of the substrate 11, and is connected to a circuit pattern with solder by the rear-face side of the substrate 11. The air cored coil 13 winds winding spirally, is formed, and it is attached to the substrate 11 so that the roller may become level to the surface of the substrate 11 within the centrum of the air cored coil 12. The lead of the air cored coil 13 is inserted in the breakthrough of the substrate 11, and is connected to a circuit pattern with solder by the rear-face side of the substrate 11. A capacitor is mounted in the rear-face side, a capacitor is connected to the air cored coil 12 in parallel via a circuit pattern, and, as for the substrate 11, a primary side tuned circuit is formed. As for the air cored coil 13, a capacitor is connected in parallel via a circuit pattern, and a secondary tuned circuit is formed. And the air cored coil 12 and the air cored coil 13 are combined magnetically, and a double tuned circuit is formed. The coupling coefficient between the air cored coil 12 of a primary side tuned circuit and the air cored coil 13 of a secondary tuned circuit is adjusted by changing the position of the winding of the air cored coil 13 within the centrum of the air cored coil 12. That is, by putting the air cored coil of a secondary tuned circuit in the air cored coil side of a primary side tuned circuit in accordance with the direction of a roller, a coupling coefficient is enlarged and bandwidth of a double tuned circuit can be made large.

[0007]The plan and [drawing 5](#) which [drawing 4](#) shows the 2nd example of the composite electronic component of this invention are a fragmentary sectional view of [drawing 4](#). In [drawing 4](#) and [drawing 5](#), the substrate with which 41 has two or more terminals, and 42 and 43 are air cored coils. The air cored coil 42 is attached to the substrate 41 so that the roller may become vertical to the surface of the substrate 41, and a lead is connected to a circuit pattern with solder by the rear-face side of the substrate 41. The air cored coil 43 is attached to the substrate 41 so that the roller may become vertical to the surface of the substrate 41 within the centrum of the air cored coil 42. The lead of the air cored coil 43 is connected to a circuit pattern with solder by the rear-face side of the substrate 41. And a capacitor is connected to the air cored coils 42 and 43 via the circuit pattern of the substrate 41, respectively, and a primary side tuned circuit and a secondary tuned circuit are formed. The composite electronic component formed in this appearance can also adjust the coupling coefficient between air cored coils by putting the air cored coil 43 in the direction of the air cored coil 42 within the centrum of the air cored coil 42.

[0008]The plan and drawing 7 which drawing 6 shows the 3rd example of the composite electronic component of this invention are a fragmentary sectional view of drawing 6. Vertically [a roller] to the surface of the substrate 61, the air cored coils 62 and 63 are attached to the substrate 61, respectively so that the air cored coil 63 may be located in the centrum of the air cored coil 62. The core 64 of ring shape is arranged between this air cored coil 62 and the air cored coil 63. The core 64 of ring shape is fixed to the substrate 61 by a binder etc. And a capacitor is connected to the air cored coils 62 and 63 via the circuit pattern of the substrate 61, respectively, and a primary side tuned circuit and a secondary tuned circuit are formed. The composite electronic component formed in this appearance can adjust the coupling coefficient between air cored coils with the height of the core 64 of the ring shape arranged between the air cored coil 62 and the air cored coil 63.

[0009]As mentioned above, although the example of the composite electronic component of this invention was described, it is not restricted to these examples. For example, the air cored coil of a secondary tuned circuit is attached to a substrate so that the roller may become vertical to the surface of a substrate, and the air cored coil of a primary side tuned circuit may attach to a substrate so that it may be located in the centrum of the air cored coil of a secondary tuned circuit. A screw core may be screwed in the centrum of the 2nd air cored coil located in the centrum of the 1st air cored coil in the 2nd and 3rd example.

[0010]

[Effect of the Invention]As stated above, since the 1st air cored coil is attached to a substrate so that the roller may become vertical to the surface of a substrate, and the 2nd air cored coil is attached to a substrate so that it may be located in the centrum of the 1st air cored coil, the composite electronic component of this invention, The occupation area of the double tuned circuit in a substrate can be made small. Therefore, even if the composite electronic component of this invention forms a double tuned circuit using an air cored coil, shape is made as for it to 1/2 compared with the conventional thing.

[Translation done.]